

State of California Department of Health Services  
Microbial Diseases Laboratory  
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**REFERENCE SERVICES IN MICROBIOLOGY - MICROBIAL DISEASES LABORATORY**

1. Reference services of the Microbial Diseases Laboratory (MDL) supplement the diagnostic and reference service of the local public health laboratories.
2. Local health departments should be prepared to supply necessary containers, forms, and information to laboratories and physicians in their jurisdiction.
3. When indicated in the table below, call MDL before collecting and sending specimens.
4. Please fill out laboratory forms completely including all clinical and laboratory data requested. Failure to do so may delay testing. For information needed on Pure Cultures for Identification, see Control of Communicable Diseases in California (1), pp. 17-24.
5. Send by mail, or where indicated, by more rapid means of transport. Observe proper packaging and labeling requirements mandated by Federal Regulations.
6. If refrigeration (or freezing) is required, be sure refrigerant is adequate for time in transit. Indicate on outside of package if it is to be refrigerated or frozen upon receipt.
7. All specimens for the Centers for Disease Control & Prevention (CDC) must be submitted through MDL unless otherwise indicated. Necessary information must accompany the specimen.
8. **Potential Bioterrorism agent Protocol:**
  1. **Notify the nearest FBI Field Office immediately when suspected cases and environmental exposure situations arise.**  
(California locations: Los Angeles, Sacramento, San Diego, and San Francisco).
  2. **Contact the Microbial Diseases Laboratory at (510) 412-3700 within one hour of request, to comply with California State Regulations.**
  3. **Contact your local Public Health Laboratory for assistance in obtaining Level B testing.**  
Potential bioterrorism microbes include:  
*Bacillus anthracis*  
*Brucella* species  
*Burkholderia pseudomallei*  
*Francisella tularensis*  
*Yersinia pestis*  
Botulism toxin

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
<i>Bacillus anthracis</i> (anthrax)	Identification and confirmation by gamma phage testing, direct FA, and/or PCR.	Pure cultures or specimens	MDL	<b>*Potential bioterrorism agent.</b> See note 8 on page 1.
<i>Brucella sp.</i>	Identification and confirmation	Pure cultures		<b>*Potential bioterrorism agent.</b> See note 8 on page 1.
<i>Burkholderia pseudomallei</i>	Identification and confirmation	Pure cultures		<b>*Potential bioterrorism agent.</b> See note 8 on page 1.
Cholera				See <i>Vibrio cholerae</i> .
<i>Clostridium botulinum</i>	Testing for:  toxin  Isolation  Identification	Serum  Stool  Vomit  Foods  Pure cultures  Other	MDL	<p><b>*Potential bioterrorism agent.</b> See note 8 on page 1.</p> <p>Call MDL before submitting specimens when foodborne botulism is suspected: working hours, evening, weekends, and holidays (510) 412-3700.</p> <p>Complete an MDL #176 form for each specimen.</p> <p>Perishable foods must be kept refrigerated or frozen until delivered to laboratory. (Do not freeze foods unless already frozen.) Refrigerate sera and stools. Hand deliver or send by most rapid means of transport.</p> <p>Consult MDL in suspected wound botulism cases.</p>
<i>Coccidioides immitis</i>				See Fungi.

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
<i>Corynebacterium diphtheriae</i>	Confirmation of identification  Toxigenicity testing  Typing*	Pure cultures	MDL  CDC  CDC*	*Typing of <i>C. diphtheriae</i> isolates is restricted to epidemiologic studies.
<u><i>Escherichia coli</i></u> Hemorrhagic	Serotyping, Shiga toxin assay (Vero cell assay), PCR for Stx, H7	Stool and pure cultures	MDL	Call MDL for additional information, (510) 412-3700.
Enterotoxigenic	Serotyping, heat labile and stable toxin assays	Stool and pure cultures		
Enteroinvasive	Serotyping, HEp-2 Invasion Assay	Stool and pure cultures		
Enteropathogenic	Serotyping, HEp-2 Adherence Assay	Stool and pure cultures		
Enteraggregative	HEp-2 Adherence Assay	Stool and pure cultures		
Cytotoxic distending toxin	CHO Cell Assay, PCR	Stool and pure cultures		
Cytotoxic necrotizing factor	Hep-2 Cell Assay, PCR	Stool and pure cultures		
Foodborne Disease	Detection, Isolation, and	Cultures	MDL	Call MDL before sending specimens, (510) 412-3700.

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
Organisms	Identification	Foods		
Fungi	Identification	Pure cultures	MDL	<b>NOTE: Postal regulations require that the above cultures be sent by registered mail or other carrier with tracking of packages.</b>
Klebsiella and Serratia	Molecular subtyping	Pure cultures	MDL	Cultures may be tested if warranted by epidemiologic investigation (arrangements must be made with MDL before sending cultures, (510) 412-3700.
Legionella	Identification	Pure cultures	MDL	Assistance in identification to genus. Species and serogroup can be determined for epidemiologic investigations.
Leprosy				Contact Hansen's Disease Regional Center in San Francisco, Los Angeles, or San Diego (see "Control for Communicable Diseases in California").
Miscellaneous bacteria, including: aerobic actinomycetes, anaerobes, gram positive and gram negative rods and cocci.	Identification  Serologic Grouping and Typing  Biotyping Molecular Typing	Pure cultures  Pure cultures  Pure cultures	MDL  MDL and/or CDC  MDL and/or CDC	Assistance in identification of miscellaneous bacteria when the clinical and laboratory data indicate involvement of the isolate in a disease process.   Please call MDL before submitting cultures for molecular typing at (510) 412-3700.

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Molecular subtyping	Nosocomial or community outbreaks	Pure cultures	MDL	Available for a variety of infectious agents, please contact MDL at (510) 412-3700.before sending cultures.
Mycobacteria	Identification	Pure cultures	MDL	Assistance in identification of mycobacteria.
	Drug susceptibility tests	Pure cultures	MDL	Testing for susceptibility to primary drugs, INH, Rifampin, Ethambutol, and PZA, is restricted to cultures of <i>M. tuberculosis</i> or <i>M. kansasii</i> from public health laboratories unable to provide this service, and to problem cultures from other laboratories (submitter's results must accompany specimen). Testing for susceptibility to secondary drugs, including Streptomycin, will be performed if requested, and if the isolate is resistant to rifampin or any two primary drugs.
	DNA Fingerprinting	Pure cultures of <i>M. tuberculosis</i> complex	CDC	Additional secondary drugs (ciprofloxacin, rifabutin, and cycloserine) and MICs for members of the <i>M. fortuitum</i> complex.
<i>Neisseria gonorrhoeae</i>	Confirmation	Pure cultures	MDL	Services restricted to special epidemiological investigations or investigations of suspected cross-contamination. Please contact MDL at (510) 412-3700.before sending cultures.
Plague				See <i>Yersinia pestis</i> .

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
<i>Pseudomonas aeruginosa</i>	Molecular subtyping (PFGE)			Testing is restricted to multiple cultures for epidemiologic purposes.
Salmonellae	Identification  Serotyping Phage typing*  Molecular epityping	Pure cultures	MDL  CDC*	Human isolates <b>MUST</b> be sent to local or state laboratory; see sections in Manual (1) on Salmonellosis.  *Phage typing of salmonellae other than <i>S. typhi</i> may be available for special investigations (call MDL before sending cultures, (510) 412-3700. Phage typing of <i>S. typhi</i> available at CDC for outbreaks only. Epidemiological tracing of <i>S. typhi</i> isolates now done by PFGE.
Shigellae*	Serotyping*  Molecular epityping	Pure cultures	MDL	*Services restricted to special epidemiological investigations and problem cultures.
Group A Streptococci, Beta-hemolytic	M & T Typing	Pure cultures	CDC	Service restricted to special cases where type may be significant (epidemiologic studies, etc.).  Call MDL before sending cultures, (510) 412-3700.
<i>Streptococcus Pneumoniae</i>	Serotyping       Antimicrobial Susceptibility Testing	Pure cultures	CDC      CDC	Availability restricted to patients who may represent a pneumococcal vaccine failure. In addition to usual clinical data, give date immunized (month and year) and name of vaccine (e.g., 14 valent, 23 valent, etc.). Note any underlying conditions potentially affecting susceptibility to infection and current status of patient (well, deceased, etc.). Specimens must be sent through MDL. *Testing for penicillin resistance.

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
<i>Staphylococcus aureus</i>	Pulsed field gel electrophoresis for epidemiologic investigations*	Pure culture of coagulase-positive <i>Staphylococcus aureus</i>	MDL	<p>*Not available for single cultures or individual patients' isolates. Epidemiologic studies required before cultures are submitted. Complete epidemiological information as well as complete information concerning the patients and cultures (date of isolation, specific source, antibiotic sensitivity pattern, etc.) must be included. The Division of Communicable Disease Control (510) 540-2566, is prepared to offer consultation and assistance in the epidemiological studies required before cultures are submitted.</p> <p>Pure cultures cannot be tested in the absence of complete information.</p> <p>Restriction to foodborne outbreaks with adequate history. Foods must be sent for testing refrigerated and by most rapid means of transport (call MDL before sending specimens at (510) 412-3700.</p>
	Enterotoxin	Food samples	MDL	
Tuberculosis				See Mycobacteria.
Typhoid				See Salmonellae.
<i>Vibrio cholerae</i>	Identification/Biotyping	Pure cultures	MDL	<p>Biotyping for El Tor or Classical biotypes</p> <p>O1, Inaba, and Ogawa serogrouping</p> <p>O139 serogrouping</p> <p>Cholera toxin assay (vero cell, latex)</p>
	Serotyping Toxin testing Molecular subtyping		CDC	

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
Vibrio, Other species	Identification Hemolysin testing Molecular epityping	Pure cultures	MDL	Identification by biochemical and other special tests.  Currently, MDL would like all isolates submitted.
<i>Yersinia enterocolitica</i>  <i>Yersinia pseudotuberculosis</i>	Identification Serotyping Biotyping Molecular epityping	Pure cultures	MDL	Currently, MDL would like all isolates submitted.
<i>Yersinia pestis</i>	Isolation        Identification & Confirmation	Aspirates from bubos  Blood Cultures  Sputum  Animal tissues  Ectoparasites (fleas pools)  Isolates	MDL       MDL	<b>*Potential bioterrorism agent.</b> See note 8 on page 1.  Specimens for plague examination must be sent to your nearest Level B Laboratory for direct FA and culture  Call MDL before sending specimens, workdays, weekends, and holidays (510) 412-3700.



**- SERVICES IN PARASITOLOGY -**

ORGANISM OR DISEASE	SERVICES	SPECIMENS	SOURCE	COMMENTS
Blood parasites	Identification  Confirmation	Blood films	MDL	<p>Services include examination of thick and thin blood films, impression smears, tissue sections, etc. for blood parasites (malarial parasites, hemoflagellates, filarial worms, etc.); and isolation of hemoflagellates by cultivation and animal inoculation.</p> <p>Call MDL, (510) 412-3700, before sending specimens for cultivation.</p>

**References**

1. Control of Communicable Diseases in California, 1983.
2. American Public Health Association.
3. California State Department of Health Services, 1992.